

# POWER PROTECTION

## The Key to Industrial Productivity

Surge suppressors and UPS systems are vital to maintaining industrial productivity in manufacturing environments because they safeguard vital factory automation equipment against damage, data loss and downtime caused by common power problems. Protecting process controls, factory automation systems and other manufacturing equipment against power problems doesn't need to be expensive or complicated: a wide range of affordable solutions provide safe, reliable power and complete protection for every vulnerable circuit.

### The Problem with Power

Power problems can be traced back to a variety of sources. The most dramatic sources, such as natural disasters, knock out power completely by severing utility lines and plunging factory floors into darkness. Less dramatic sources, such as overburdened circuits, introduce unseen threats like surges, line noise and brownouts. Every unprotected line going into your equipment, whether it carries power or data, represents a potential conduit for power problems.

- **Surge / Spike**

Surges and spikes are short-term voltage increases. They cause catastrophic equipment damage, data corruption and incremental damage that degrades equipment performance. The incidence of surges and spikes rises with thunderstorm activity, lightning strikes, ground faults and sudden power restoration after outages. Because repeated surges can degrade protection over time, it is necessary to replace or supplement surge protection circuitry periodically, especially where protection status is not indicated.

- **Line Noise**

Line noise (EMI/RFI) encompasses electromagnetic interference, radio frequency interference, harmonic distortion and waveform irregularities in line power. It causes incremental electronic circuit damage, data corruption and signal degradation, including audio/video quality problems. Line noise increases with power fluctuations and usage of electric motors, fluorescent lighting and other equipment that introduces interference in local circuits. Thunderstorm activity also contributes to line noise.

- **Brownout**

A brownout is a voltage deficiency or sag that occurs when power demand exceeds power availability. Brownouts cause equipment failures, incremental damage, decreased stability and data loss. Brownouts become more frequent as heat waves increase air conditioner usage and electricity demands, forcing utilities to lower line voltage. Site brownouts also occur as air conditioners and electric motors start and stop, repeatedly overloading building electrical circuits with peak power demands.

- **Blackout**

A blackout, outage or power failure is a complete loss of AC power. Blackouts cause reduced productivity, lost revenue, system crashes and data loss. Blackouts increase in frequency and duration as high winds, lightning strikes and natural disasters disrupt or disable utility lines and other power distribution equipment. As heat waves drive increased air conditioner usage, utility companies may be forced to institute rolling blackouts. Unplanned outages also occur as the aging electrical grid and building circuits malfunction due to previously undetected condition problems and overwhelming current demands.

### Power Problems Are Common & Costly

- 4 power problems strike the average electronic device every day.
- 45% of data loss is caused by common power problems.
- U.S. industry loses up \$188 billion each year due to equipment damage and lost productivity caused by power problems.

Sources: IBM, Contingency Planning, Electric Power Research Institute

### Tripp Lite Has Solutions for Every Application



In-Line Network Surge Suppressors



Strip Surge Suppressors



Rackmount Surge Suppressors



Line-Interactive UPS Systems



On-Line UPS Systems

## Choose the Best Protection

Modern manufacturing systems require several different types of external connections to function. Connections to utility power are the most obvious, but there may also be connections for phone lines, high-capacity data circuits and other circuits. Each connection is a path for lightning and other electrostatic discharges to enter the facility, potentially damaging expensive equipment and disrupting production. Tripp Lite protects your equipment against every power problem on every circuit.

Decide whether you need a surge suppressor, UPS system or both. Most installations will benefit from both, with UPS systems protecting process controls, factory automation systems and other manufacturing equipment that either cannot have any downtime or cannot have unplanned downtime. Because UPS systems protect against a wider range of damaging power problems, they're also appropriate for protecting costly and sensitive equipment that doesn't require battery backup. Surge suppressors provide basic, economical protection against some of the most damaging power problems.

## Surge Suppressors Provide Basic Protection

### • In-Line Network Surge Suppressors

Installing Tripp Lite's in-line network surge suppressors on data circuits protects equipment connected to those lines from surges and spikes. Each of the in-line data network surge suppressors includes a lead that connects to facility ground.

### • Multi-Outlet Strip Surge Suppressors

Tripp Lite multi-outlet strip surge suppressors provide heavy-duty surge/spike protection and line noise filtration. Tripp Lite's premium Isobar® surge suppressors include the most robust surge-blocking architecture available, as well as isolated filter banks that eliminate interference between devices plugged into the same strip. Select models include data line protection (tel/modem, coaxial or network). Rackmount models are also available.

## UPS Systems Provide Battery Backup & Advanced Protection for Critical Systems

### • Standby UPS Systems

ECO, Internet Office® and BC series standby UPS systems provide surge/spike/noise protection like surge suppressors and add battery backup to keep equipment operating during blackouts. They also provide limited brownout protection by switching to battery. Select models include data line protection, communication ports and energy-saving outlets.

### • Basic Line-Interactive UPS Systems

In addition to the protection offered by standby UPS systems, Digital, OmniSmart™, VS and AVR series line-interactive UPS systems add Automatic Voltage Regulation (AVR). AVR allows the UPS system to adjust voltage to safe levels during brownouts without switching to battery power, reducing battery wear and preserving charge levels for enhanced blackout protection.

### • SmartPro® Line-Interactive UPS Systems

SmartPro UPS systems offer advanced AVR for improved brownout protection and enhanced microprocessors for more complex communications with connected computers. Select models include a network card slot, expandable battery backup runtime and pure sine wave power from battery, ensuring maximum equipment stability and compatibility.

### • SmartOnline™ UPS Systems

SmartOnline UPS systems offer the best protection available. True on-line operation with continuous AC-to-DC-to-AC double conversion isolates sensitive electronics from power problems. Precision-regulated, pure sine wave output power guarantees maximum equipment stability and compatibility. All models include a network card slot and expandable battery backup runtime.

## Summary of Protection Features

Protection Type						
	In-Line Network Surge Suppressor	Multi-Outlet Strip Surge Suppressor	Standby UPS System	Basic Line-Interactive UPS System	SmartPro UPS System	SmartOnline UPS System
Surge/Spike Protection	Good	Good	Good	Good	Good	Best
Line Noise Protection	None	Good/Better*	Good	Good	Good	Best
Brownout Protection	None	None	Limited**	Good	Better	Best
Blackout Protection	None	None	Good	Good	Better	Best
Additional Features						
Expandable Runtime	n/a	n/a	No	OMNIVS1500XL Only	Select Models	All Models
Communications	No	No	Basic	Basic	Advanced	Advanced
Voltage Regulation	No	No	No	Good	Better	Best (±2-3%)
Pure Sine Wave Power from Battery	n/a	n/a	No	No	Most Models	All Models
On-Line Operation	n/a	n/a	No	No	No	Yes
Maximum Capacity	n/a	Up to 2,400W	Up to 940W	Up to 940W	Up to 4,000W	Up to 18,000W***

\*"Better" refers to Isobar models. \*\*Standby UPS systems protect against brownouts by switching to battery power. \*\*\*3-phase UPS systems available up to 128,000W. Tripp Lite has a policy of continuous improvement. Specifications are subject to change without notice. All trademarks are the sole property of their respective owners.

